



Distributed Interactive Fire Mission

Fire Control for the 21st Century

US Army TACOM

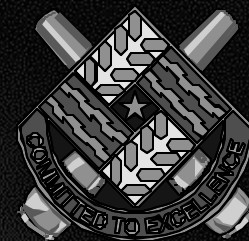
Armament Research Development and Engineering Center

Fire Support Armaments Center

Fire Control and Life Cycle Software Engineering Division

Picatinny Arsenal, New Jersey

Distributed Interactive Fire Mission



Beyond

“Classic” individual system fire control

TO

Fire control for the battlefield group

Distributed Interactive Fire Mission



Description/ Definition

A framework of linked fire control elements on distributed battlefield platforms that act in concert with one another to provide enhanced firing solution computation and efficient application of firepower assets to the engagement of individual and multiple targets.



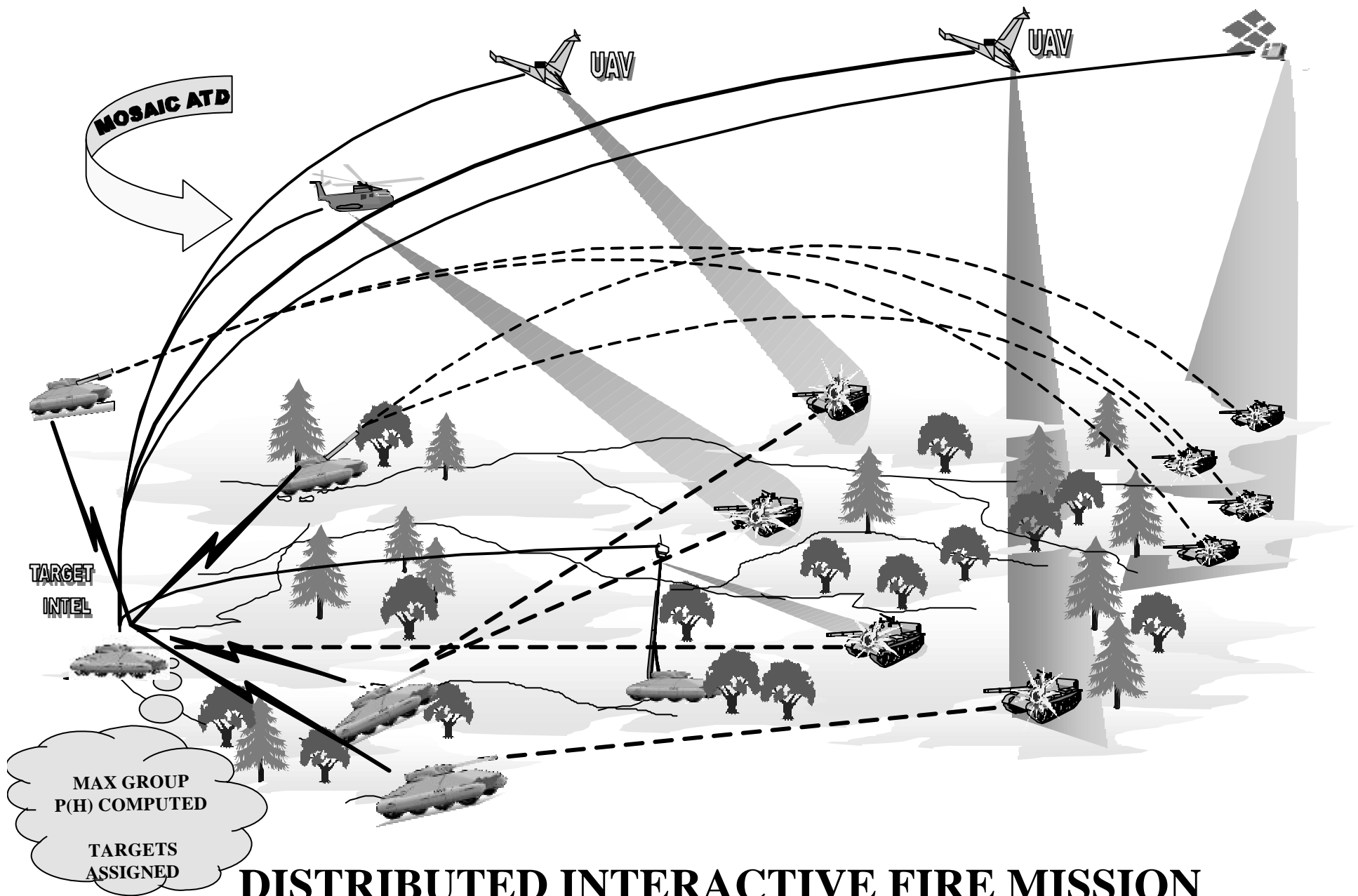
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Is Not:

- A command and control system
- A communications system
- B2C2 / CVCC / IVIS / FBCB2 / Appliqué
- A planning or logistics status assessment tool
- A graphical display terminal or other crew interactive device

But:

Must appropriately interface with these items in order to function



DISTRIBUTED INTERACTIVE FIRE MISSION (DIFM)

Distributed Interactive Fire Mission



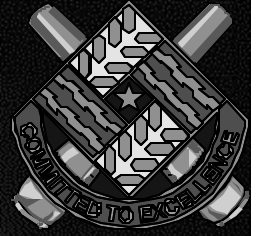
Concept Features/ Characteristics

Filters data to extract needed information

Uses calculated $P\{H\}$ values for target assignments to each firing platform in a group

Dynamic REAL-TIME tactical firing assignments and adjustments throughout the battle, running continuously in background

Distributed Interactive Fire Mission



SAMPLE DATA ELEMENTS

TARGET STATE

- LOCATION
- SPEED
- DIRECTION
- THREAT VALUE
- PREDICTED LOCATION

NON-STANDARD CONDITIONS

- CROSSWIND / RANGEWIND
- AIR TEMP / AIR DENSITY
- PROPELLANT GRAIN TEMP

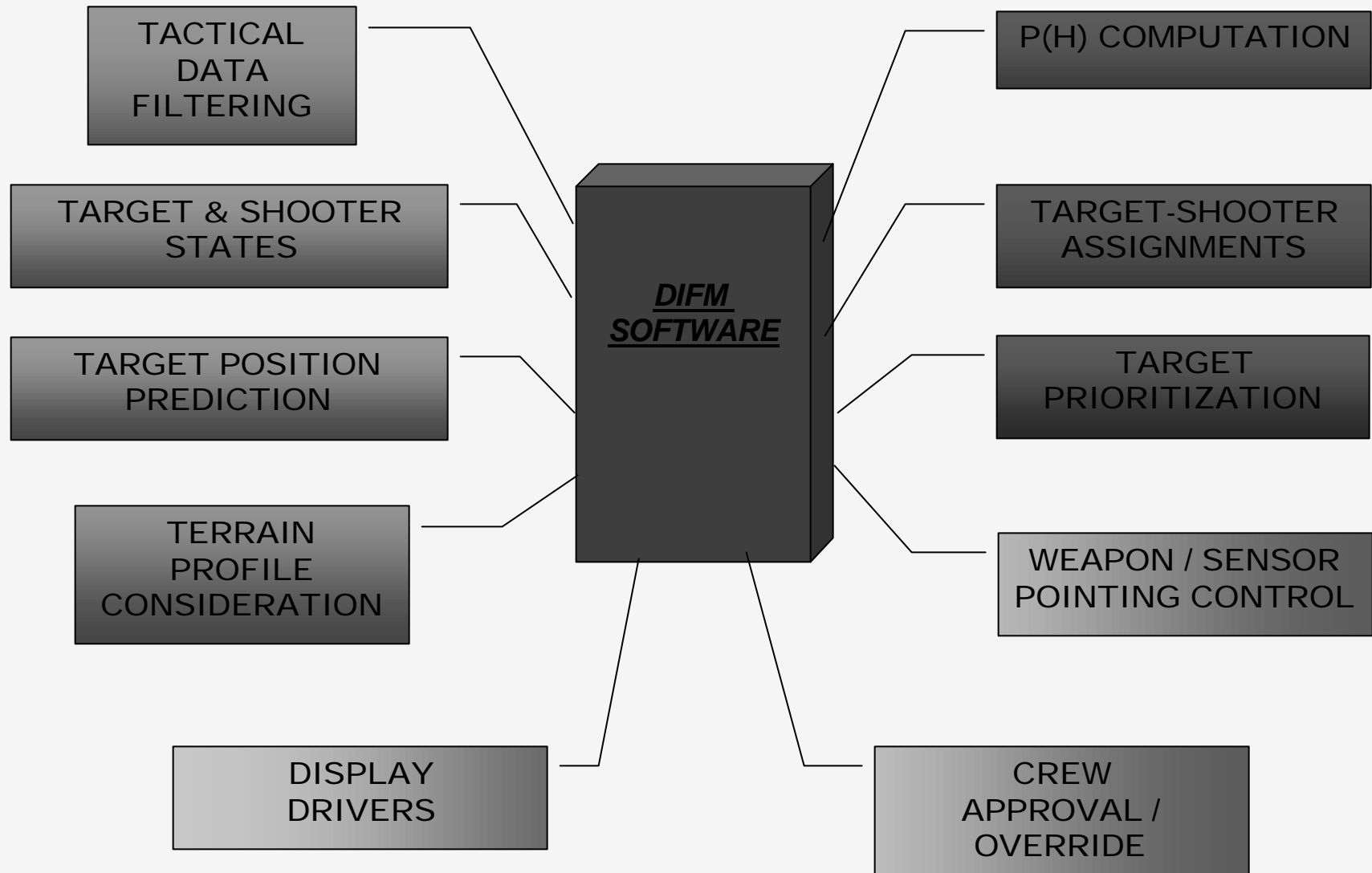
FIRING PLATFORM STATE

- READINESS
- LOCATION
- SPEED
- DIRECTION
- PITCH / CANT
- TURRET / HULL RELATION
- READY ROUND TYPE
- MUZZLE POSITION

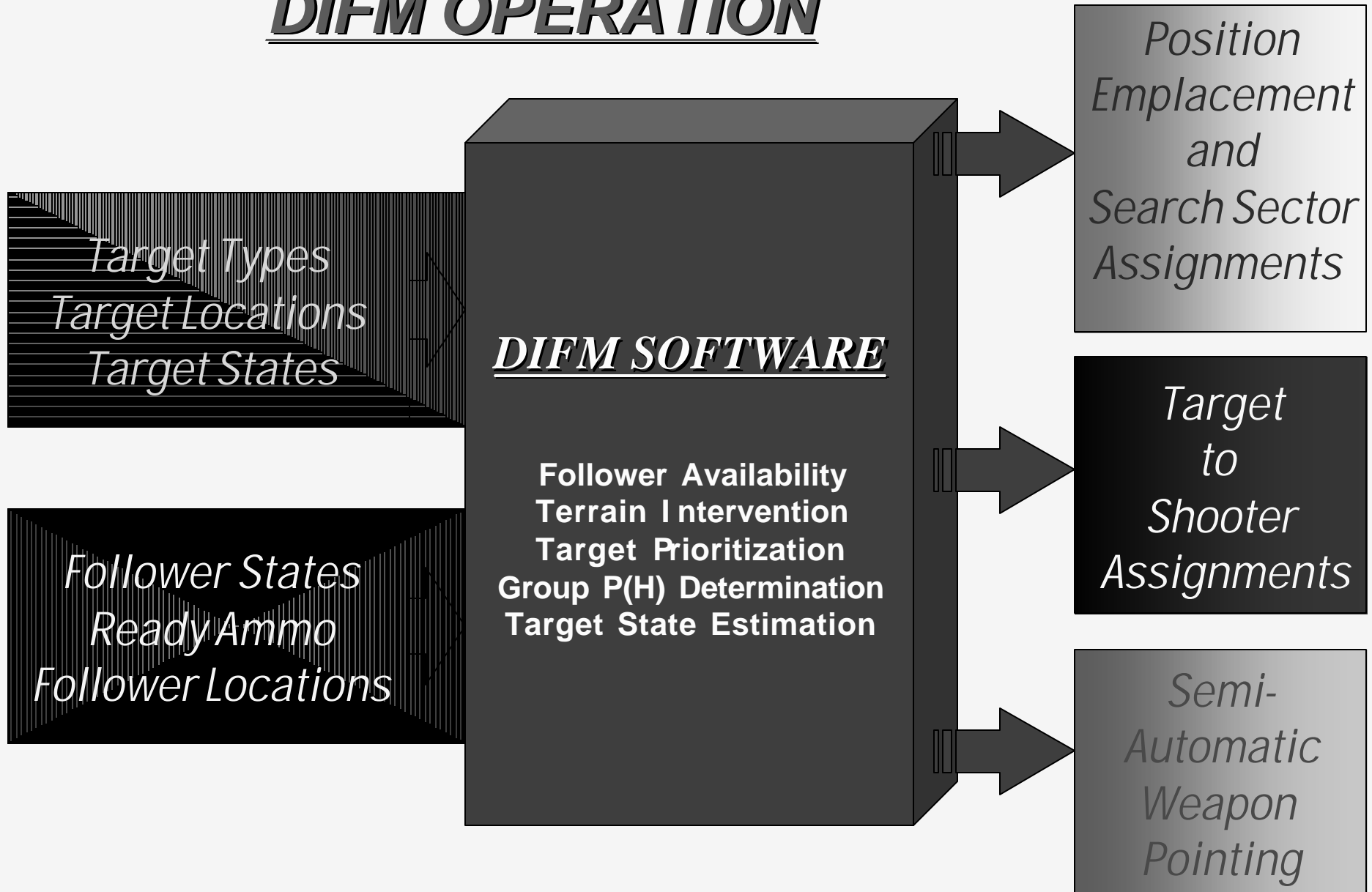
TERRAIN DATA

- ELEVATION
- CONTOURS
- LOS RESTRICTIONS

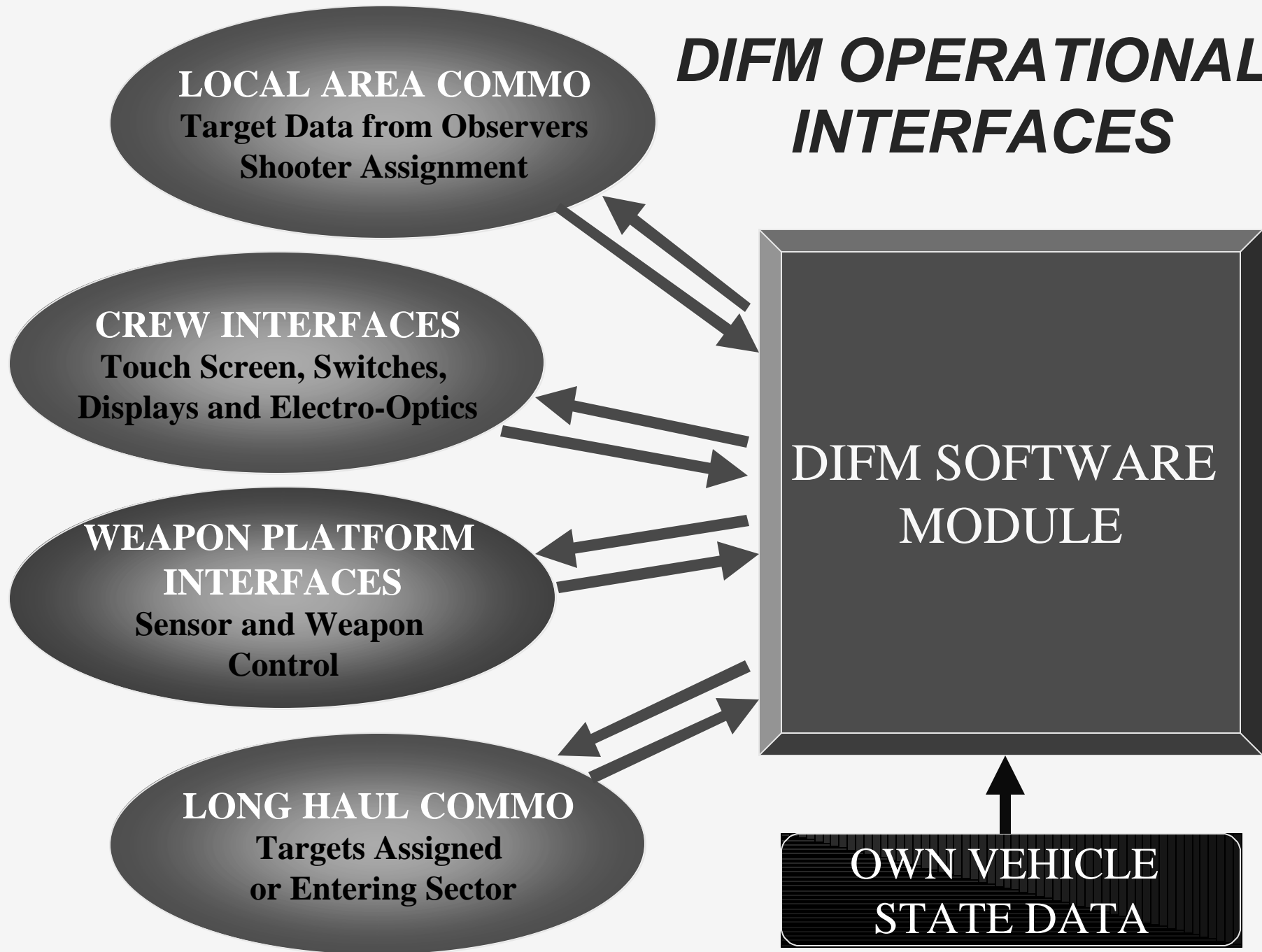
Software Modules and Functions



DIFM OPERATION



DIFM OPERATIONAL INTERFACES



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Payoff

Uses platform and target state data to compute hit probabilities for all elements in unit
Optimizes shooter / target pairings

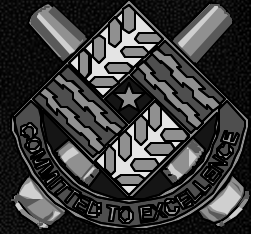
Reduces the incidence of fratricide through multiple vantage point target data and observation before firing

Mitigates overkill or underkill during multiple target engagements and conserves ammunition

Improves target servicing rates
Rapid reaction
Increases Optempo

Improves target state estimation through maximum use of available multiple platform sensors

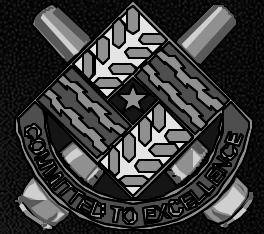
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STATUS / TECH OBJECTIVES

- PART OF THE MULTI-ROLE ETC ARMAMENTS STO FOR FCS
- DEVELOP THE MULTI-SHOOTER ALGORITHM
- SIMULATE THE SOFTWARE FUNCTION AND BATTLEFIELD OPERATION
- MEASURE PERFORMANCE IN TERMS OF TECHNICAL EXIT CRITERIA

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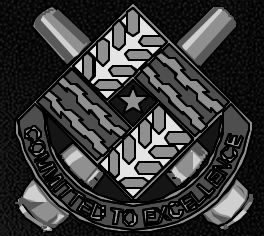
Increase

**Target Hits per Stowed Ammunition Load
Target Kills per Stowed Ammunition Load
Target Servicing Rate (Optempo)**

Decrease

**Time to Complete Assigned Mission (Optempo)
Ammunition Consumption per Mission
Friendly Mortality Rate
Fratricide Rate**

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POINTS OF CONTACT

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